Neuronal mechanisms for sensorimotor flexibility in *Drosophila*

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To ensure survival in an ever-changing, complex world, animal behavior needs to be flexible and adaptive. Nervous systems have evolved to enable behavioral responses to a wide variety of sensory stimuli, but the adequate response to a given stimulus is highly context-dependent, and behavioral or internal states accordingly affect sensorimotor processing. For example, locomotion modulates responses of visual neurons, and hunger increases food-searching behavior and shifts taste preferences. Despite their ubiquitous importance, the neural mechanisms enabling context-dependent sensorimotor flexibility are not well understood. My lab aims to shed light on these mechanisms by leveraging the power of neurogenetics, electron microscopy-based circuit reconstruction, and *in-vivo* patch-clamp recordings in behaving *Drosophila*. In this talk, I will first focus on the key role descending neurons play in selecting contextually appropriate behaviors. Second, I will discuss our efforts to develop a better understanding of the complex arsenal of modulatory neurons in the brain, and their role in conferring flexibility to sensorimotor circuits.